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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/740,961	12/21/2000	Charles C. Hsu	03440.84880	6298

7590 11/18/2003
Thomas E. Anderson
Hunton & Williams
1900 K Street, N.W.
Washington, DC 20006-1109

EXAMINER

TABATABAI, ABOLFAZL

ART UNIT	PAPER NUMBER
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2625

DATE MAILED: 11/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/740,961

Applicant(s)

HSU ET AL.

Examiner

Abolfazl Tabatabai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-3, 9-12, 16-19 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shapiro (U S 5,315,670) in view of Stromberg et al (U S 6,594,394 B1).

Regarding claim 1, Shapiro discloses a data processing system augments compression of non-zero value, comprising the steps of:

recursively transforming an image using Discrete Wavelet Transform (column 5, lines 29-33) to create a plurality of levels including at least a first level (column 3, lines

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44-54), multiple n levels (column 2, lines 21-27), and a low-low pass subband of level n , wherein n is the number of levels (column 3, lines 35-63 and column 4, lines 1-6);

quantizing the transformed image at each level (column 5, lines 24-34); and, datapacking the quantized image, wherein the datapacking step further comprises:

encoding of the first level using adaptive run length of zero coefficients (column 5, lines 43-50);

encoding of the multiple n levels using run-length coding of zero coefficients and a predetermined two-knob huffman table for non-zero coefficients (column 6, lines 16-33).

However, Shapiro is silent about specific details regarding the step of:

encoding of the low-low pass subband of level n using a low frequency packing algorithm.

In the same field of endeavor, however, Stromberg discloses a system for performing compression and decompression of seismic data comprising the step of:

encoding of the low-low pass subband of level n using a low frequency packing algorithm (column 6, lines 21-39).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the step of encoding of the low-low pass subband of level n using a low frequency packing algorithm as taught by Stromberg in the system of Shapiro because Stromberg provides a system and method of fast multi-dimensional transform which uses an adaptive basis selection, and another manner in which the

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compression/decompression can be advantageously utilized is in an application service provider environment. As will be recognized by those skilled in the art, recent advances in high speed communication links (mostly notably internet) have resulted in entities who serve as remote sites for other users to execute licensed software from third parties.

Regarding claim 2, Shapiro discloses the method wherein the step of encoding of the first level further comprises the steps of:

scanning the quantized image to find largest coefficient magnitude (column 9, lines 3-26);

storing the largest non-zero coefficient magnitude in a header (column 7, lines 63-68 and column 19, lines 25-30);

run-length coding of the zero coefficients in the quantized image (column 5, lines 43-50); and,

encoding the non-zero coefficients using a predetermined huffman table (column 6, lines 16-33).

Regarding claim 3, Shapiro discloses the method wherein the step of encoding of the first level further comprises the steps of: if a non-zero coefficient is not found in the predetermined huffman table, encoding an escape code and encoding the non-zero coefficient in signed bit representation (column 6, lines 16-33 and column 8, lines 1-25).

Claim 9, is similarly analyzed as claim 1 above.

Regarding claim 10, Shapiro discloses an encoder of compressing image data, comprising:

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a quantizer for mapping the coefficients into discrete regions by a predetermined compression parameter (column 19, lines 20-45); and,

a datapacker for compressing the mapped coefficients wherein the datapacker encodes a plurality of zero coefficients at the first level by adaptive run length coding, a plurality of non-zero coefficients at the intermediate levels by a two-knob Huffman coding and the low-low subband at the highest level by low frequency coding (column 6, lines 16-33).

However, Shapiro is silent about specific details regarding the step of:

a two-dimensional discrete wavelet filter for transforming the input data into plurality of coefficients forming a first level, intermediate levels, and a low-low subband of a highest level.

In the same field of endeavor, however, Stromberg discloses a system for performing compression and decompression of seismic data comprising the step of:

a two-dimensional discrete wavelet filter for transforming the input data into plurality of coefficients forming a first level, intermediate levels, and a low-low subband of a highest level (column 6, lines 64-67; column 7, lines 9-11 and 26-28).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the step a two-dimensional discrete wavelet filter as taught by Stromberg in the system of Shapiro because Stromberg provides a system and method of fast multi-dimensional transform which uses an adaptive basis selection, and another manner in which the compression/decompression can be advantageously utilized is in an application service provider environment. As will be recognized by those

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skilled in the art, recent advances in high speed communication links (mostly notably internet) have resulted in entities who serve as remote sites for other users to execute licensed software from third parties.

Claim 11, is similarly analyzed as claim 2 above.

Claim 12, is similarly analyzed as claim 10 above.

Claim 16, is similarly analyzed as claim 1 above.

Claim 17, is similarly analyzed as claim 10 above.

Claim 18, is similarly analyzed as claim 1 above.

Claim 19, is similarly analyzed as claim 1 above.

Claim 21, is similarly analyzed as claim 17 above.

Claim 22, is similarly analyzed as claim 18 above.

Claim 23, is similarly analyzed as claim 19 above.

Claim 24, is similarly analyzed as claim 17 above.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 4-8, 13-15, 20 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shapiro (U S 5,315,670) and Stromberg et al (U S 6,594,394 B1) as applied to claims 1,10 and 17 and further in view of Divakaran et al (6,618,507).

Regarding claim 4, Shapiro discloses the method wherein the step of encoding of the first level further comprises the steps of: encoding a run in the quantized image by using three bits (column 5, lines 23-28).

However, Shapiro and Stromberg are silent about specific details regarding the step of:

if three bits are not enough to write the run, encoding a zero codeword.

In the same field of endeavor, however, Divakaran discloses a methods of feature extraction of video sequences comprising the step of:

if three bits are not enough to write the run, encoding a zero codeword (column 1, lines 34-44).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the step of encoding a zero codeword as taught by Divakaran in the system of Shapiro because Divakaran provides operating on the video sequences information in its compressed form, rather than its decompressed or decode form wherein possible, usually permits more rapid processing because of the reduction

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in data size. It is advantageous to develop methods and techniques, which permit operating directly on compress data, rather than having to perform full frame decompression before other processing is performed.

Regarding claim 5, Shapiro and Stomberg are silent about specific details regarding the step of: scanning the quantized image after run-length coding of the zero coefficients to find the longest run; and storing the longest run.

In the same field of endeavor, however, Divakaran discloses a methods of feature extraction of video sequences comprising the step of:

scanning the quantized image after run-length coding of the zero coefficients to find the longest run; and storing the longest run (column 4, lines 37-47 and column 15, lines 32-42).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the step of scanning the quantized image after run-length coding of the zero coefficients to find the longest run; and storing the longest run as taught by Divakaran in the system of Shapiro because Divakaran provides operating on the video sequences information in its compressed form, rather than its decompressed or decode form wherein possible, usually permits more rapid processing because of the reduction in data size. It is advantageous to develop methods and techniques which permit operating directly on compress data, rather than having to perform full frame decompression before other processing is performed.

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Regarding claim 6, Shapiro and Stomberg are silent about specific details regarding the step of: determining a long run or a short run based on the magnitude of the longest run.

In the same field of endeavor, however, Divakaran discloses a methods of feature extraction of video sequences comprising the step of:

determining a long run or a short run based on the magnitude of the longest run (column 4, lines 37-47 and column 15, lines 32-42).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the step of determining a long run or a short run based on the magnitude of the longest run as taught by Divakaran in the system of Shapiro because Divakaran provides operating on the video sequences information in its compressed form, rather than its decompressed or decode form wherein possible, usually permits more rapid processing because of the reduction in data size. It is advantageous to develop methods and techniques, which permit operating directly on compress data, rather than having to perform full frame decompression before other processing is performed.

Regarding claim 7, Shapiro and Stomberg are silent about specific details regarding the step of: calculating a difference between a plurality of DC coefficients and a plurality of AC coefficients, thereby defining a plurality of DC difference values.

In the same field of endeavor, however, Divakaran discloses methods of feature extraction of video sequences comprising the step of:

calculating a difference between a plurality of DC coefficients and a plurality of AC coefficients, thereby defining a plurality of DC difference values (column 2, lines 37-53).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the step of calculating a difference between a plurality of DC coefficients and a plurality of AC coefficients, thereby defining a plurality of DC difference values as taught by Divakaran in the system of Shapiro because Divakaran provides operating on the video sequences information in its compressed form, rather than its decompressed or decode form wherein possible, usually permits more rapid processing because of the reduction in data size. It is advantageous to develop methods and techniques which permit operating directly on compress data, rather than having to perform full frame decompression before other processing is performed.

Regarding claim 8, Shapiro and Stomberg are silent about specific details regarding the step of: writing the DC coefficients and the DC difference values to an encoded data stream in unsigned bit representation in a row wise manner.

In the same field of endeavor, however, Divakaran discloses methods of feature extraction of video sequences comprising the step of:

writing the DC coefficients and the DC difference values to an encoded data stream in unsigned bit representation in a row wise manner (column 2, lines 12-16 and 37-53).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the step of writing the DC coefficients and the DC difference

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values to an encoded data stream in unsigned bit representation in a row wise manner as taught by Divakaran in the system of Shapiro because Divakaran provides operating on the video sequences information in its compressed form, rather than its decompressed or decode form wherein possible, usually permits more rapid processing because of the reduction in data size. It is advantageous to develop methods and techniques, which permit operating directly on compress data, rather than having to perform full frame decompression before other processing is performed.

Regarding claim13, Shapiro and Stomberg are silent about specific details regarding the step of: the data packer at the first level encodes a run of zero-coefficients by writing a zero indicator followed by a predetermined number of data elements. In the same field of endeavor, however, Divakaran discloses methods of feature extraction of video sequences comprising the step of:

the data packer at the first level encodes a run of zero-coefficients by writing a zero indicator followed by a predetermined number of data elements (column 1, lines 33-44 and column 4, lines 37-50).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the step of the data packer at the first level encodes a run of zero-coefficients by writing a zero indicator followed by a predetermined number of data elements as taught by Divakaran in the system of Shapiro because Divakaran provides operating on the video sequences information in its compressed form, rather than its decompressed or decode form wherein possible, usually permits more rapid processing because of the reduction in data size. It is advantageous to develop methods and

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techniques, which permit operating directly on compress data, rather than having to perform full frame decompression before other processing is performed.

Claim 14, is similarly analyzed as claim 13 above.

Claim 15, is similarly analyzed as claims 7 and 8 above.

Claim 20, is similarly analyzed as claim 8 above.

Claim 23, is similarly analyzed as claim 20 above.

Other prior art cited

7. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

U. S. Patent (5,867,602) to Zandi et al is cited for reversible wavelength transform and embedded code stream manipulation.

U.S. Patent (5,734,755) to Ramchandran et al is cited for JPEG/MPEG decoder-compatible optimized thresholding for image and video signal compression.

U S. Patent (6,141,446) to Boliek et al is cited for compression and decompression system with reversible wavelets and lossy reconstruction.

U S. Patent (5,819,215) to Dobson et al is cited for apparatus and method for wavelet bases data compression having adaptive bit rate control for compression of digital audio or other sensory data .

Contact Information

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8. any inquiry concerning this communication or earlier communications from the Examiner should be directed to ABOLFAZL TABATABAI whose telephone number is (703) 306-5917.

The examiner can normally be reached on Monday through Thursday from 9:30 a.m. to 7:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Bhavesh Mehta M, can be reached at (703) 308-5246.

Any response to this action should be mailed to:

Assistant Commissioner for Patents
Washington, D.C. 20231

or faxed to:

(703) 872-9306 (for **formal** communications; please mark
"EXPEDITED PROCEDURE")

Hand delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA. Sixth Floor (Receptionist).

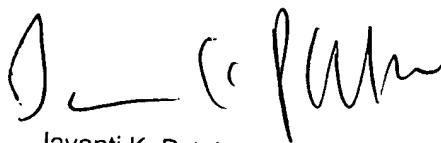
Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 305-4750

Abolfazl Tabatabai

Patent Examiner

Group Art Unit 2625

November 11, 2003



Jayanti K. Patel
Primary Examiner